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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/726,248	12/02/2003	James E. Walson	59376US002	3537
32692	7590	02/21/2006	EXAMINER	
3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			GUHARAY, KARABI	
			ART UNIT	PAPER NUMBER
			2879	

DATE MAILED: 02/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/726,248

Applicant(s)

WALSON ET AL.

Examiner

Karabi Guharay

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>8/05, 4/05, 5/05</u> . | 6) <input checked="" type="checkbox"/> Other: <u>IDs, filed 8/04, 4/04</u> . |

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 38 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 38 recites the limitation "intermediate layer". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-9, 11-15, 17-23, 25-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (US 6155699), and further in view of Durocher et al. (US 6733711).

Regarding claims 1-2, 4, 12-13, 15, 26-27, 31, Miller discloses a light source comprising (see Fig 2) comprising light emitting diode die (12) capable of emitting LED light (blue light), optical coupler (14 & 22) for coupling light from LED, phosphor patches (36) disposed between the LED dies and the optical coupler to convert at least a portion of the LED light propagating to coupler (22) from the LED die and an intermediate layer or first layer (30) disposed between the LED die and the phosphor, the intermediate or

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first layer transmitting LED light and reflecting light converted in the phosphor, intermediate layer (30) having a first side (inner surface) facing the LED and a second side (outer surface) facing the coupler (22), and phosphor is disposed on the second side of the intermediate layer (lines 10 of column 5 -line 45 of column 6).

But Miller does not explicitly disclose plurality of such light sources arranged in regular array.

However, Durocher et al. teaches plurality of LED light sources arranged in regular array (see Fig 11) on a substrate (see Fig1 & Fig 11) in order to form an LED array module for lighting purposes (see abstract & lines 21-22 of column 1).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate plurality of LED lighting source in the device of Miller, arranged in an array in order to produce an array module for lighting purposes.

Regarding claims 3 &14, Miller discloses that the LED die 12 is encapsulated by encapsulating layer 28 (lines 23-27 of column 5).

Regarding claims 6-8 & 17, Miller discloses the coupler (14) formed with aperture having reflective sidewalls (lines 10-16 of column 5).

Regarding claims 9, 22, 30; Miller discloses a reflecting layer (side wall of 14) disposed to reflect LED light that has passed through the phosphor layer back to the phosphor layer back to the phosphor layer (since reflecting layer 14 extends above the phosphor patch 52).

Regarding claims 11 & 25, Miller discloses that the electric power is applied to the LED (which inherently provides a power supply, see lines 50-52 of column 1).

Regarding claims 18 & 28, Miller et al. disclose that the phosphor layer (36) is provided on the intermediate layer (30) and positioned corresponding to areas of the intermediate layer illuminated by LED die (see Fig 2).

Regarding claims 19-20, Miller et al. disclose that the coupler (14) is formed in aperture through the coupler sheet and the phosphors are registered with the apertures (Fig 2), and phosphor patch (36) register with the aperture and extends into the aperture from the intermediate layer (Fig 2).

Regarding claims 21 & 23, Miller et al. disclose that the intermediate layer (30) reflects converted wavelength (lines 40-45 of column 6).

Regarding claim 29, Miller et al. disclose that the first layer (30) reflects light converted by the phosphor to a longer wavelength than the wavelength of the LED light (lines 17-33 of column 7).

Claims 10, 24 rejected under 35 U.S.C. 103(a) as being unpatentable over Miller & Durocher et al. as applied to claim 1 above, and further in view of Ota et al. (US 6943380).

Regarding claims 10 & 24, combined structure of Miller & Duracher et al. teaches all the limitations of claims 10 & 24 except for a set of optical fibers disposed to receive light from the coupler.

However, Ota et al. discloses LED light source and further teaches the use of optical fibers for extracting and optical transmission of light emitted from LED (lines 28-35 of column 11).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use set of optical fibers in order to transmit light from the LED array.

Claims 5,16 & 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Miller & Durocher et al. as applied to claim 1 above, and further in view of Shimizu et al. (US 6949772).

Regarding claims 5,16 & 32, combined structure of Miller and Durocher teaches all the limitations of claims 5 & 16, except for at least one standoff disposed on the substrate between intermediate layer and the substrate.

However, Shimizu et al. in the same field of light source comprising LED arrays discloses a substrate on which LED arrays are disposed (see Fig 4a & 4b) and further teaches stand-off structure (bump 16 of Fig 5a & 61 of Fig 14a) in order to provide a path for heat dissipation from the LED chip to the substrate (lines 45-52 of column 15).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate stand-off structure, as disclosed by Shimizu et al. in the combined structure of Miller & Durocher, since this will provide increased heat dissipation from the LED chips.

Claims 33-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. (US 6949772), and further in view of Miller et al. (US 6155699).

Regarding claims 33-39, Shimizu et al. disclose a method of assembling a light source comprising providing a plurality of LED dies arranged in a regular array patterns on a LED subassembly and attaching the LED subassembly (see Fig 1a & 1b) to a first

layer (23) comprising holes (32a) providing reflecting layer and with transparent mold (24) which is substantially transparent to the LED light (lines 7-16 of column 2), positioning the first layer over the LED dies so that light passes through the first layer (23), where first layer comprises a plurality of stand-offs (24) and attaching the first layer comprises attaching the stand-offs to the LED subassembly (lines 43-57 of column 1).

However, Shimizu et al. fails to disclose a layer of phosphor as patches on a surface of the first layer corresponding to areas where light passes from the LED dies, and the first layer transmits LED light but reflects light that is wavelength converted in the phosphor.

Miller et al. in the same field of LED lighting disclose a light source (see Fig 2) comprising LED die (12), a first layer (28, 30) disposed over the LED die, the first layer (28, 30) layer being substantially transparent to the LED light (lines 9-18 of column 6), the LED light propagating through the first layer from a first side to a second side and a phosphor layer disposed as patch (36) on the second side (lines 62-67 of column 5), the first layer transmits LED light but reflects light that is wavelength converted in the phosphor (lines 10-45 of column 6). Miller further teaches that such DBR mirror (30) and the disposition of phosphor (36) on the DBR mirror improves the flux of light emitted from the light source (lines 58 of column 20line 9 of column 3).

Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a first layer (30) and a phosphor layer (36) as disclosed by Miller et al. in the device of Shimizu et al, since this will provide improved light emission.

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Other Prior Art Cited

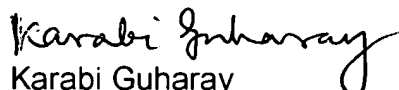
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure :Lowery (Us 5959316); Odaki et al. (US 6521915).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karabi Guharay whose telephone number is (571) 272-2452. The examiner can normally be reached on Monday-Friday 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Karabi Guharay
Primary Examiner
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